

Appendix G  
Wastewater Report





## **WASTEWATER SYSTEM REPORT**

**For**

**STATELINE RETAIL CENTER  
Town of Southeast, New York**

**December 12, 2008**

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## 1.0 INTRODUCTION

The subject project is located on a 44-acre ± parcel along U.S. Route 6 in the Town of Southeast, between Interstate 84 and U.S. Route 6. Located in the GC-2 zoning district, the site is designated as Tax Map Number 68-2-48, and is in the East Branch Reservoir Watershed. Existing ground cover is characterized as a mixture of woods and meadow throughout the majority of the site. The subject parcel is proposed to be developed as a retail center consisting of buildings, access roads, parking and landscaping. Access to the site will be provided off of U.S. Route 6. Water will be supplied to the site by drilled wells that will serve as a non-community public water supply for the project. Wastewater will be disposed of with two subsurface sewage treatment systems (SSTS's). This report is prepared to address the wastewater systems only.

The wastewater systems will be designed in accordance with all applicable codes and regulations, including the Putnam County Department of Health's *Bulletin CS-31, Program Review and Policies, Sewage Treatment and Water Supply Facilities for Commercial and Multifamily Residential Projects*, the New York State Department of Environmental Conservation (NYSDEC)'s 1988 *Design Standards for Wastewater Treatment Works – Intermediate Sized Sewerage Facilities* (DEC 88), and the 2004 *Recommended Standards for Wastewater Facilities* (a.k.a. Ten-State Standards).

Two SSTS areas will be utilized for sewage treatment at the site. The West SSTS Area will be located on Lot 1, is the smaller of the two systems, and will service a proposed office building. Located on the easternmost portion of the site the second system, herein referred to as the East SSTS Area, will service Lot 2, and subsequently the majority of the development for the site.

## 2.0 WASTEWATER DESIGN FLOW

The proposed uses for the subject site includes an office building and a retail center with multiple retail buildings, community center on the second floor of Retail Building C, a café, and a retail pharmacy. Retail users for the proposed center are planned to be dry retail users. Dry retail occupants use limited water resources, and the majority of the water use is limited to primarily restroom usage for employees. The use of water saving plumbing fixtures, as required by the building code, would further limit water usage at the site. Please note that irrigation water will be supplied by a separate system that will collect and store roof runoff for that purpose.

The reference design standards for water and wastewater flows provide general design flows covering a broad range of usage categories. The NYSDEC's Design Standards provide two alternatives for establishing design flows: hydraulic loading rate tables or water usage data. In either case, a daily design flow rate must be calculated. The daily design flow rate is a conservatively high estimate of daily flow used by the engineer in the design of the water and sewer infrastructure when actual water usage data is unavailable.

All of the design flows for the subject project are based on actual water usage of similar facilities for the representative users, with the exception of the office building, and community center / office / personal services facility. In the last two instances design flows are based on the hydraulic loading rate of 0.08 GPD/ SF (0.1 GPD/ SF with a 20% reduction as allowed by the NYSDEC's Design Standards) from DEC 88. DEC 88 does not require the application of a factor of safety to the hydraulic loading rates, therefore one was not applied in determining the design flows for the office building and community center / office / personal services facility. However, where actual water usage information has been utilized it has been commonly accepted by the PCDOH and the NYCDEP to apply a factor of safety of 1.5 to actual flows for use as design flows. This practice has been applied in the design flow calculations contained in this report. The proposed design flows for each SSTS area are discussed in further detail below. For the purposes of this report, the project's two SSTS's will be discussed separately in the following sections.

2.1 WEST SSTS AREA

A 14,800 SF office building is proposed on Lot 1, which is on the western portion of the site. The building is proposed to be supported by its own well and SSTS. Based upon the recommended hydraulic loading rate of 0.08 GPD/SF for office buildings (see discussion in Section 2.0), the design flow for the office building would be approximately 1,184 GPD. Rounding up, a design flow of 1,200 GPD will applied in designing the West SSTS Area.

2.2 EAST SSTS AREA

The following flow analysis provides water consumption data for the groups of uses proposed for the East SSTS Area on Lot 2. All data presented herein is based on actual measured water usage within the Tri-State region, which will be utilized to estimate representative wastewater usage for the centralized system serving the main portion of the subject project. This does not include the 14,800 SF office building located on Lot 1 which will be serviced by its own well and septic system (West SSTS Area). The intention of this evaluation is to support the wastewater design flows utilized for the subject project wastewater system based on actual water consumption of similar uses, or published unit flow estimates. For the purposes of this evaluation, the main portion of the project will be broken into five distinct components as follows:

1. Dry Retail Uses.
2. Sandwich Shop/Cafe.
3. Community center / office space / personal services facility.
4. Retail Pharmacy.

Insite contacted municipal and private water suppliers to obtain water flow data from similar uses. Each section below includes the information that was made available. The user names listed are similar category retailers, and not necessarily future occupants of Stateline Retail Center.

2.2.1 Dry Retail Uses

Dry Retailers include retail stores of varying sizes that only utilize water for restroom and employee convenience (lunch room, lounge) purposes. These would exclude supermarkets, restaurants, fast food establishments, and other retail establishments that would utilize water for a purpose other than restroom use. Below is a summary of regional water consumption data gathered for a varying sizes of retail establishments:

**Small Dry Retail Stores (less than 10,000 sf)**

Store	Approx. Building Area (sf)	Location	Time Period	Avg. Daily Flow (gpd)	Avg. Daily Flow per Bldg. Area (gpd/sf)
Village Paint	2,300	Carmel	7/07 to 9/07	18	0.0078
Radio Shack	2,300	Carmel	7/07 to 9/07	18	0.0078
Rockaway Bedding	4,500	Carmel	7/07 to 9/07	24	0.0053
Pier 1 Imports	9,500	Middletown	4/06 to 9/07	52	0.0055

**Mean      0.0066 gpd/sf**

**Medium Dry Retail Stores (between 10,000 sf and 40,000 sf)**

Store	Approx. Building Area (sf)	Location	Time Period	Avg. Daily Flow (gpd)	Avg. Daily Flow per Bldg. Area (gpd/sf)
CVS	10,000	Pawling	1/06 to 9/07	84	0.0084
Rite Aid	10,000	Carmel	7/07 to 9/07	303	0.0303
Payhalf	13,000	Wappingers Falls	1/07 to 11/07	17	0.0013
Michael's	25,000	Newburgh	7/06 to 9/07	176	0.0070
AC Moore	26,000	Wappingers Falls	1/07 to 11/07	449	0.0173
AC Moore	30,000	Middletown	4/06 to 9/07	342	0.0114
Linens N Things	32,000	Middletown	4/06 to 9/07	172	0.0054
Bed Bath & Beyond	35,000	Newburgh	1/07 to 9/07	148	0.0042
Toys R Us	38,000	Middletown	4/06 to 9/07	456	0.0120

**Mean 0.0108 gpd/sf**

**Large Dry Retail Stores (greater than 40,000 S.F.)**

Store	Approx. Building Area (sf)	Location	Time Period	Avg. Daily Flow (gpd)	Avg. Daily Flow per Bldg. Area (gpd/sf)
Best Buy	45,000	Middletown	4/06 to 9/07	532	0.0118
Dick's Sporting Goods	45,000	Middletown	4/06 to 9/07	227	0.0050
Kohls	75,000	Middletown	4/06 to 9/07	932	0.0124
Kohls	75,000	Newburgh	10/06 to 9/07	596	0.0079
Gander Mountain	123,000	Middletown	4/06 to 9/07	976	0.0079

**Mean 0.0090 gpd/sf**

As can be seen from the above data, the lowest water usage for average daily flow per building area is with the small dry retail stores. This is primarily due to the fact that the smaller stores do not have customer bathrooms, have very few employees, and low volume of customer usage. The next highest average daily flow per building area is for the large dry retail stores. Although the stores do have customer restrooms, a larger number of employees, and a more vibrant customer base, their water usage is spread over a large building area that lessens the average daily flow per building area. The highest average daily flow per building area lies with the medium dry retail stores. This group of stores typically does include a customer restroom, a moderate number of employees and a vibrant customer base. With the limited building square footage, the average daily flow per building area tends to be slightly higher than the other two categories. The mean for this category, which is the highest of the three categories, is 0.0108 gallons per day per square foot of building area. It is proposed to utilize this highest average daily flow per building area and round it to a value of 0.011 gallons per day per square foot.

### 2.2.2 Sandwich Shop/Cafe

It is envisioned the project will have one sandwich shop similar to that of Quizno's or Subway, and would occupy approximately 2,000 square feet and include seating for approximately 20 customers. This use provides take-out sandwiches, snacks and beverages that would utilize water and generate wastewater from restroom use and light food preparation. Low water use is achieved by utilizing paper products (no washing of customers dishes), and most of the food is sold as take-out (eaten off site). Based on the size and type of proposed sandwich shop use, the sandwich shop total wastewater usage is estimated at 450 GPD.

### 2.2.3 Community Center / Office / Personal Services

There is approximately 11,000 SF of space anticipated to be utilized as a community center / office area / personal services facility. Based upon the recommended hydraulic loading rate of 0.08 GPD/SF for office buildings (see discussion in Section 2.0) the design flow for the this area would be approximately 880 GPD. Since the DEC 88 published hydraulic loading rates were utilized a factor of safety was not applied.

### 2.2.4 Retail Pharmacy

Approximately 14,800 SF of space is anticipated to be used as a retail pharmacy. Water use data for this type of facility typically varies from 250 GPD to 350 GPD, and comes from employee / customer restroom usage. The more conservative 350 GPD will be utilized to determine the overall design flow.

### 2.2.5 East SSTS Area Design Flow Summary

Based upon the data collected as discussed above, the following table has been prepared illustrating the building identification (as appearing on the project drawings), proposed use, square footage and corresponding design flows:

**Table 1 - East SSTS Design Flow Summaries**

BUILDING	PROPOSED USE	BUILDING SQUARE FOOTAGE (SF)	AVG. DAILY FLOW PER BLDG. AREA (GPD/SF)	DAILY FLOW	WASTEWATER DESIGN FLOWS (GPD)
A	DRY RETAIL	134,000	.011	1,474 <sup>1</sup>	2,211
B	DRY RETAIL	25,000	.011	275 <sup>1</sup>	413
C (1 <sup>ST</sup> FLOOR)	DRY RETAIL	9,000	.011	99 <sup>1</sup>	149
C (1 <sup>ST</sup> FLOOR)	CAFE	2,000	—	450 <sup>2</sup>	675
C (2 <sup>ND</sup> FLOOR)	COMMUNITY CENTER/OFFICE/ PERSONAL SERVICES	11,000	—	888 <sup>3</sup>	880
D	RETAIL PHARMACY	14,800	—	350 <sup>2</sup>	525
<b>Total =</b>					<b>4,853</b>
<b>Total Wastewater Design Flow used for Design =</b>					<b>4,900</b>

<sup>1</sup> Value referenced from actual flow data as discussed in Section 2.2. A factor of safety of 1.5 was applied in calculating design flow.

<sup>2</sup> Value referenced from past experience with similar establishment as discussed in Section 2.2. A factor of safety of 1.5 was applied in calculating design flow.

<sup>3</sup> Based on DEC 88 hydraulic loading rates, no factor of safety applied.

2.2.6 References

- Home Depot, 9 locations in NJ flow data from report entitled “Water Consumption Study for Home Depot” prepared by Menio Engineering Associates, Inc. dated June 26, 2003.
- Wappingers Falls flow data provided by Severn Trent Services, Inc. for the Alpine Commons site.
- Carmel flow data provided by Town of Carmel Engineering Department for Carmel Water District #2.
- Pawling flow data provided by Pawling Joint Sewer Commission.
- Middletown flow data provided by Town of Wallkill Water Department.
- Newburgh flow data provided by Town of Newburgh.

**3.0 WASTEWATER COLLECTION SYSTEM**

**3.1 WEST SSTS AREA**

The proposed Lot 1 configuration includes one stand-alone building. The wastewater collection system will consist of an individual 4" diameter PVC SDR 35 sewer service connection for the building. The sewer service connection will discharge into a precast concrete septic tank for primary treatment, which will then be pumped to the absorption fields via an engineered pump pit. The pump pit will convey effluent to the absorption fields via a 2" diameter PVC SDR 21 forcemain.

**3.2 EAST SSTS AREA**

The proposed building configuration on Lot 2 involves three separate groups of buildings. Each building will be contain a 4" diameter PVC SDR 35 sewer service connection discharging to a common 6" diameter PVC SDR 35 sewer main. The sewer main will discharge to a series of septic tanks for primary treatment from which effluent will be discharged to an engineered pump station. The sewer lines are proposed to be located generally in the proposed roads, parking areas and landscaped islands. Wastewater flow from all of the proposed buildings will be by gravity to the septic tanks and pump station. From the precast concrete duplex pump station, two 2.5" diameter PVC SDR 21 sewer force mains will convey effluent to the absorption trenches.

**4.0 SEPTIC TANKS**

**4.1 WEST SSTS AREA**

The septic tank (ST-3) for the West SSTS will be located adjacent proposed building on Lot 1. The septic tank will be sized to be greater than 1.5 times the design flow for the proposed building.

$$1.5 \times 1,200 \text{ gpd} = 1,800 \text{ gallons required}$$

Septic Tank ST-3, a 2000-gallon septic tank is proposed to service the building. The tank will be reinforced concrete, per the details on the project plans, and will be provided with inlet tees and access manhole covers. ST-3 shall comply to H-20 loading. All wastewater collection network piping shall be 4" diameter PVC SDR 35.

**4.2 EAST SSTS AREA**

The two proposed septic tanks for the East SSTS will be centrally located along the northern end of the parking area on Lot 2. A combined capacity greater than or equal to 1.5 times the design flow will be provided in the two septic tanks. In addition, the capacity of the first tank has been sized so it comprises 68% of the total design flow volume. A summary of the design flows, required tanks sizes, and provided septic tank sized has been provided below:

**Table 2 - East SSTS Septic Tank Summary Table**

Building	Total Design Flow (gpd)	Factor of Safety	Required Total Septic Tank Capacity (gallons)	Proposed Septic Tank Size (gallons)
ST-1	4,900	1.5	7,350	5,000
ST-2				3,000

Each septic tank will be reinforced concrete, per the details on the project plans. The septic tanks will be provided with inlet tees and access manhole covers. Additionally, it is proposed to

provide a grease trap prior to the septic tanks to service the proposed sandwich shop in Building C, where increased levels of fats, grease, and oils are anticipated. All septic tanks and grease traps shall comply to H-20 loading. All wastewater collection network piping shall be 6" diameter PVC SDR 35.

## 5.0 WASTEWATER PUMPING SYSTEMS

### 5.1 WEST SSTS

The pump pit on Lot 1 will consist of a 2,000 gallon precast concrete tank rated for H-20 loading. Inside the pump pit will be dual alternating, Goulds #3885 WEO5HH, effluent pumps discharging to a 2" diameter PVC SDR 21 force main. Each pump will be connected to a slide rail with stainless steel pulling chains for maintenance and replacement. Pump operations will be controlled by a three float control system with pump off, pump on, and a high level alarm / lag pump on setting. An audio / visual high level alarm will be placed inside the building on Lot 1. Capacity has been provided in the pit to allow for one-days design flow storage above the high level alarm.

### 5.2 EAST SSTS

The pump station will include a wet well with duplex submersible effluent pumps, valve pit, and controls. The electrical meter and service panel, breaker panel, pump controls transfer switch for auxiliary power, and an automatic standby emergency generator is proposed for the wastewater pump station. Twin 2.5" diameter PVC SDR 21 forcemains will deliver the septic tank effluent from the pump station to the southern SSTS area. The east SSTS area is divided into two large groups of absorption trenches (Groups 1 and 2). Each group will be connected to one of the forcemains. Each group will be divided into 4 equal length sections of absorption trenches (8 sections total).

#### 5.2.1 Pumps

Duplex submersible effluent pumps have been designed to convey the septic tank effluent generated from the proposed retail configuration. The pumps will be housed in an eight-foot diameter, fifteen-foot deep wet well. The submersible pumps will be controlled via a liquid level probe in the wet well that will turn the pumps on or off depending on the water level within the wet well. The pump controller will also alternate the lead/lag designation of the pumps. Additionally, a backup float system will be provided to operate the pumps independent of the probe controls in the event of a probe control system failure.

#### 5.2.2 Pump Design Criteria

Based upon an average design flow rate of 4,900 gallons per day (gpd) and a peaking factor of 4.0, a peak design sewage inflow rate of 20 gallons per minute (gpm) was calculated. Since the proposed project is active only in the day and early evening, a 16-hour day was utilized in the peak flow calculation. Using the 2.5" diameter force main, a force main length of 1,150 feet, a static head of 12.7 feet, and losses associated with bends, entrance and exit losses and valves, a total dynamic head (TDH) of 29 feet was calculated at the design flow of 36 gpm using a Hazen-Williams "C" value of 120. These computations are attached.

Based upon a review of pump curves from various manufacturers an Goulds 3885 effluent pump, Model WEO5H with a 0.5 horsepower (hp), was selected for the pump station. The selected pump will pump 36 gpm at a TDH of 29 ft with a C value of 120 for the force main. System head curves and the selected pump curve are attached.

#### 5.2.3 Pump Controls

A Submersible Level Control system is proposed for the pump station. This system is composed of a multi-sensored liquid detection probe to control and monitor the operation of the duplex pump station and provide lead-lag automatic alternation and high and low level alarms (Visual and Audible).

The pump control panel shall be equipped with four settings on a submersible level control probe to control the timed doses to be discharged. The water level must be high enough to overcome the "Both Pumps Off" (Bottom) setting in order for the pumps to be permitted to run. When the water level rises high enough to overcome the "Lead Pump Enable" (second) setting, and the time clock is in a pump enable mode, the lead pump will activate. The lead pump shall continue to run for the length of time as programmed on the pump run timer (28 minutes, as discussed in Section 5.2.6), and shall then shut off. The pump controller will alternate the lead pump at the end of each pump cycle. The pumps shall remain off until the time clock enters a new pump enable mode, at which time the lead pump shall activate (as long as the "Lead Pump Enable" setting is still triggered) and will run until the pump run timer finishes timing out. The pump run timer shall continue to operate a full pumping cycle. This process shall repeat until the water level drops below the "Both Pump Off" setting and the pump has timed out. Should either pump fail to run when called for, the pump fail circuit shall remove the failed pump from service and activate the audio/visual alarm. The alarm shall remain latched until manually reset. The control system shall include an alternator override switch to allow for manual selection of the lead pump if necessary, and will be setup such that it will not interfere with the normal timing functions of the system.

The control system shall be equipped with a timer override circuit. If the water level continues to rise enough to overcome the "Lag Pump On" (third) setting, and the override selector switch is on, the pump shall be activated, regardless of the time clock position. The pump will continue to run until deactivated by the override circuit, at which time the pump will shut off and the normal pumping cycle shall resume. If the water level continues to rise enough to overcome the "High Level Alarm" (fourth) setting, the audio/visual alarm shall activate the remain latched until the silence switch is pressed. When the silence switch is pressed, the audible alarm shall be silenced and the top mounted alarm light will remain lit until the water level drops below the "High Level Alarm" setting, at which time the alarm circuit must be manually reset. The pump controls shall provide a time delay of 10 seconds between alternating pump cycles.

#### 5.2.4 Control Room

A control room will be provided in one of the buildings to be used to house the pump station electrical and control equipment in order to reduce the risk of incidents of vandalism. The room will house power panels, a transfer switch for auxiliary power, pump control panel, and an autodialer. The room will be provided with a security system and a smoke/heat detector that will notify operating personnel via an autodialer in case of fire or intrusion into the room.

#### 5.2.5 Wet Well

The pump station wet well has been designed to provide a desired dose volume of 1,011 gallons, which is 75% of the absorption trench pipe volume for each of the two SSTS groups (Four sections per group and 516 linear feet of absorption trench per section). In order to provide an equal volume dose every dose cycle, a timed dose volume system is proposed. A typical water level float based control system does not work for the subject project, since the inflow can vary from 0 gpm to 20 gpm on an average day, and fixed floats would not be able to provide an exact dose volume every dose cycle. A 28 minute pump run time will provide a 1,008 gallon dose with the 36 gpm pump flow rate. Since the pump flow rate (36 gpm) is greater than the anticipated peak design flow (20 gpm), the lag pump should not be engaged under typical conditions. Also note that if one pump malfunctions, the other pump capacity is greater than the peak daily design flow. See attached sewer pump station design calculations for more detail regarding the pump station sizing.

Guide rails for the lifting and lowering of the proposed submersible grinder pumps will be provided. A portable hoist socket has been provided at the top of the wet well. This socket will be used to support the portable hoist to be provided as part of pump station construction, in order to lift and lower the submersible pumps or trash basket.

5.2.6 Force Mains

The sewer forcemain will consist of two parallel forcemains, which will be used to convey septic tank effluent from the sewer pump station to the east SSTS area. The forcemains will be 2.5" diameter, PVC SDR 21 with bell and spigot joints and factory installed gaskets. The fittings and elbows will be glued SCH 80 fittings. The forcemain shall be provided with 3'-6" minimum ground cover. The valve pit will be configured to allow one forcemain to be shut down and have both sewage pumps discharge to the other forcemain for maintenance or repairs. Two forcemain cleanout manholes will be provide along the forcemain route for cleaning and maintenance purposes.

5.2.7 Valve Pit

A precast concrete valve pit will be provided to house gate valves, configured to allow one forcemain to be shut down and have both sewage pumps discharge to the other forcemain for maintenance or repairs. The valve pit will also house discharge pressure gauges on the force main. The valve pit will be provided with a floor drain to the wet well for removal of accumulated water. A gas and water tight check valve will be provided on the drain line.

5.2.8 Check Valves

Check valves will be provided on both pump discharge headers. The proposed check valves will be swing type with a weight and lever. The check valves will have a pressure rating of 150 psi. Due to the small diameter and length of the force main, surge pressure (the effect of water hammer on the check valves resulting from the backwater in the force main) is estimated to be negligible.

5.2.9 Distribution Boxes

There are ten (10) 14-way distribution boxes proposed for the East SSTS area. The proposed boxes are precast concrete. Each distribution box shall have a 24" cast iron manhole frame and cover for accessibility. Each distribution box will accept a dose from the pump station and distribute the flow to the associated absorption fields of that particular section.

**6.0 SUBSURFACE SEWAGE TREATMENT SYSTEMS**

6.1 WEST SSTS AREA

6.1.1 Soil Testing

Soil testing was witnessed by Insite Engineering, Surveying & Landscape Architecture P.C., the Putnam County Department of Health (PCDOH), and the New York City Department of Environmental Conservation (NYCDEP) during the SEQRA process and was determined to be acceptable for a SSTS. For the West SSTS Area, ten (10) test pits were dug to depths greater than 7' – 0" and generally consisted of slightly compacted fine sand. No bedrock was encountered in any of the holes, and several holes displayed groundwater or mottling at depths in excess of 78". Five (5) percolation tests were also performed. The rates recorded ranged from 7 to 30 minutes per inch.

6.1.2 Absorption Trenches

The SSTS will consist of conventional 2' wide absorption trenches spaced 6' on center. The absorption trench design parameters are as follows:

Design Flow =	1,200 gpd
Soil Percolation Rate =	21 to 30 min/in
Application Rate (per percolation rate) =	0.6 gpd
Absorption Trench Width =	2'

Total length of absorption trenches required (L) = 1,200 gpd ÷ 0.6 gpd/sf ÷ 2 sf/lf  
 L = 1,000 linear feet (lf) of primary absorption trenches required.

The SSTS area is proposed to provide 1,000 lf of primary absorption trenches and 100% SSTS expansion area (1,000 lf).

## 6.2 EAST SSTS AREA

### 6.2.1 Soil Testing

Soil testing was witnessed by Insite Engineering, Surveying & Landscape Architecture P.C., the Putnam County Department of Health (PCDOH), and the New York City Department of Environmental Conservation (NYCDEP) during the SEQRA process and was determined to be acceptable for a SSTS. For the East SSTS Area, nine (9) test pits were dug to depths greater than 7' - 0" and generally consisted of slightly compacted fine sand and with silt. No bedrock was encountered in any of the holes and four holes displayed groundwater at depths in excess of 78". Nine (9) percolation tests were also performed. The rates recorded ranged from 3 to 24 minutes per inch.

### 6.2.2 Absorption Trenches

The absorption fields consist of conventional 2' wide absorption trenches. The trenches will be divided into two groups (Groups 1 and 2) Each group will be divided into four sections (8 sections total). Each group will be alternately dosed. Each section includes a total trench length of 516 linear feet per section. The SSTS will consist of conventional 2' wide absorption trenches spaced 6' on center. The absorption trench design parameters are as follows:

Design Flow =	4,900 gpd
Soil Percolation Rate =	21 to 30 min/in
Application Rate (per percolation rate) =	0.6 gpd
Absorption Trench Width =	2'

Total length of absorption trenches required (L) = 4,900 gpd ÷ 0.6 gpd/sf ÷ 2 sf/lf  
 L = 4,083 linear feet (lf) of primary absorption trenches required.

The SSTS area is proposed to provide 4,128 lf (2 groups of 4 sections containing 516 lf) of primary absorption trenches (4,128 lf > 4,083 lf) and 100% SSTS expansion area (4,128 lf).

### 6.2.3 Mounding Analysis

A mounding analysis is only required by regulatory agencies if the design flow for one contiguous SSTS area is over 5,000 gpd. Although the largest SSTS area design flow is 4,900 gpd, a mounding analysis was prepared in order to study the site's hydrogeology and confirm that the shallow soils (near the trenches) can infiltrate water at a sufficient rate, and that the deeper soils can convey the water without excessive mounding or breakout.

A geotechnical engineer has conducted a groundwater mounding assessment for the project as part of the project's DEIS. This assessment indicates the project's design flows can be supported by both of the SSTS area's underlying soils.

**APPENDIX A**

West SSTS Area Pump Pit Calculations





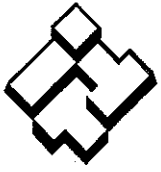
**SSTS for Stateline Retail Center**

**Pump Pit Design Calculations for Pump Pit on Lot 1 servicing West SSTS Area**

Design Flow	1200 gal/day	
Peak Flow	5.0 gpm	(based on a 16-hour day and a peaking factor of 4.0)
Static Head	22 ft	Vertical distance from bottom of pump pit to invert of distribution box
C	120	Roughness coefficient for smooth plastic pipe
d	2 in	Diameter of force main
L	375 ft	Length of force main
Q	33 gpm	Flow Rate
V	3.4 ft/s	Velocity
L <sub>e</sub>	65 ft	Equivalent length to account for losses in valves and bends
L <sub>t</sub>	440 ft	Total Length = L + L <sub>e</sub>
HL	14 ft	$HL = \frac{10.44(L_t)(Q^{1.85})}{(C^{1.85})(d^{4.87})} = .0000438(L_t)(Q^{1.85})$
Total Dynamic Head	36 ft	TDH = HL + Static Head

Use Gould Pump Model # 3885, Series WE05HH (or approved equal).

This pump will pump 33 gpm with a Total Dynamic Head of 36 feet.



# ITT

## GOULDS PUMPS Wastewater

### APPLICATIONS

Specifically designed for the following uses:

- Homes, Farms, Trailer Courts, Motels, Schools, Hospitals, Industry, Effluent Systems

### SPECIFICATIONS

#### Pump

- Solids handling capabilities: 3/4" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 140 GPM.
- Total heads: up to 128 feet TDH.
- Temperature: 104°F (40°C) continuous, 140°F (60°C) intermittent.
- See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

### MOTORS

- Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
- Class B insulation on 1/3-1 1/2 HP models.
- Class F insulation on 2 HP models.

#### Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.

- 1/3 – 1 HP models have NEMA three prong grounding plugs.
- 1 1/2 HP and larger units have bare lead cord ends.

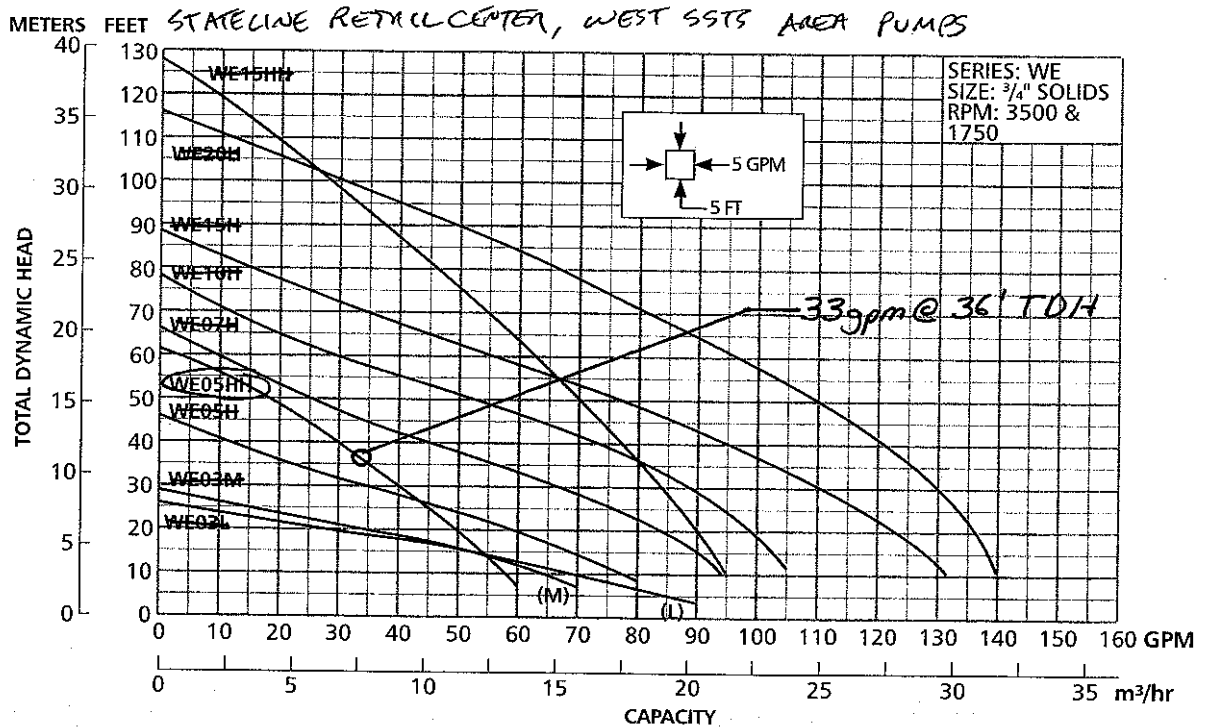
#### Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.
- **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.
- **Bearings:** Upper and lower heavy duty ball bearing construction.
- **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.
- **O-ring:** Assures positive sealing against contaminants and oil leakage.

### AGENCY LISTINGS



Tested to UL 778 and CSA 22.2 108 Standards  
By Canadian Standards Association File #LR38549  
Goulds Pumps is ISO 9001 Registered.



**APPENDIX B**

**East SSTS Area Pump Station Calculations**





# INSITE

ENGINEERING, SURVEYING &  
LANDSCAPE ARCHITECTURE, P.C.

Stateline Retail Center

11/13/2008

**Design Calculations for the Proposed Sewer Pump Station - 8' Inside Diameter**

<b>Average Daily Design Flow:</b>	<b>4,900</b>	<b>gpd</b>	(or 5.1 gpm over a 16 hour day)
<b>Peaking Factor</b>	<b>4.0</b>		
<b>Daily Peak Design Flow</b>	<b>20</b>	<b>gpm</b>	[Average Daily Design flow x Peaking Factor]

**PUMP SYSTEM HEAD**

**Static Head (ft)**

Invert in at D-Box	487.7 ft.
Grade at Pump Station	489.8 ft.
Rim of Pump Station	489.8 ft.
Influent Sewer Invert	483.2 ft.
High High Alarm	482.7 ft.
High Level Alarm	482.2 ft.
Lag Pump On	481.7 ft.
Lead Pump Enable	481.2 ft.
Both Pumps Off	478.5 ft.
Low Alarm	478.0 ft.
Low Low Alarm	477.5 ft.
Bottom of Wet Well	475.0 ft.
<b>Static Head (ft)</b>	<b>12.7 feet</b>

**Friction Head**

C (Roughness Coefficient)		120	
d (Diameter of Forcemain)		2.5	inches
L (Length of Forcemain)		1150	linear feet
Q (Flow Rate)		36	gpm
Le (Equivalent Length of valves & bends)		100	feet
Lt (Total length)		1250	feet
V (Velocity)		2.4	ft/sec
HL (Friction head Loss)	16 ft	HL =	$\frac{10.44(L)(Q^{1.85})}{(C^{1.85})(d^{4.87})}$ = .0000438(L)(Q <sup>1.85</sup> )

<b>Total Dynamic Head</b>	<b>29 feet</b>	(Static Head + Friction Head)
<b>Use 2 Goulds 3885 WE05H Effluent Pumps</b>	<b>36 gpm each</b>	<b>29 Ft. TDH</b>

**TIMED DOSE VOLUME**

Desired Dose Volume (75% of Absorption Trench Pipe Volume per Group)	1011	gallons
Desired Dose Volume (75% of Absorption Trench Pipe Volume per Group)	135.1	c.f.
Wet Well Diameter	8.0	ft.
Wet Well Cross Sectional Area	50.3	sq. ft.
Pump Flow Rate	36.0	gpm
Timed Dose Duration	1011.0 gallons / 36.0 gpm =	28.0 minutes
		use 28.0 minutes

A 28 minute pump run time will provide a 1,008 gallon dose to each group of absorption trenches (75% of trench pipe volume). Since the pump flow rate (36 gpm) is greater than the anticipated peak design flow (20 gpm), the lag pump should not be engaged under typical conditions. Also note that if one pump malfunctions, the other pump capacity is greater than the peak daily design flow.

2.5" Forcemain from pump station to D-Box = 1,150 lf = 39 c.f. = 292 gallons
4,900 gpd / 16 hours/day = 306 gallons/hour / 2 pumps = 153 gallons/pump/hour
Average travel time through forcemain = 292 gallons / 153 gallons/hour = 1.9 hours
4,900 gpd / 1,008 gallons/dose = 4.9 doses/day
4.9 doses/day / 2 pumps = 2.5 doses/pump/day



# ITT

## GOULDS PUMPS Wastewater

### APPLICATIONS

Specifically designed for the following uses:

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### SPECIFICATIONS

#### Pump

- Solids handling capabilities: 3/4" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 140 GPM.
- Total heads: up to 128 feet TDH.
- Temperature: 104°F (40°C) continuous, 140°F (60°C) intermittent.
- See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

### MOTORS

- Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
- Class B insulation on 1/3-1 1/2 HP models.
- Class F insulation on 2 HP models.

#### Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SJTOW or STOW severe duty oil and water resistant power cords.

- 1/3 - 1 HP models have NEMA three prong grounding plugs.
- 1 1/2 HP and larger units have bare lead cord ends.

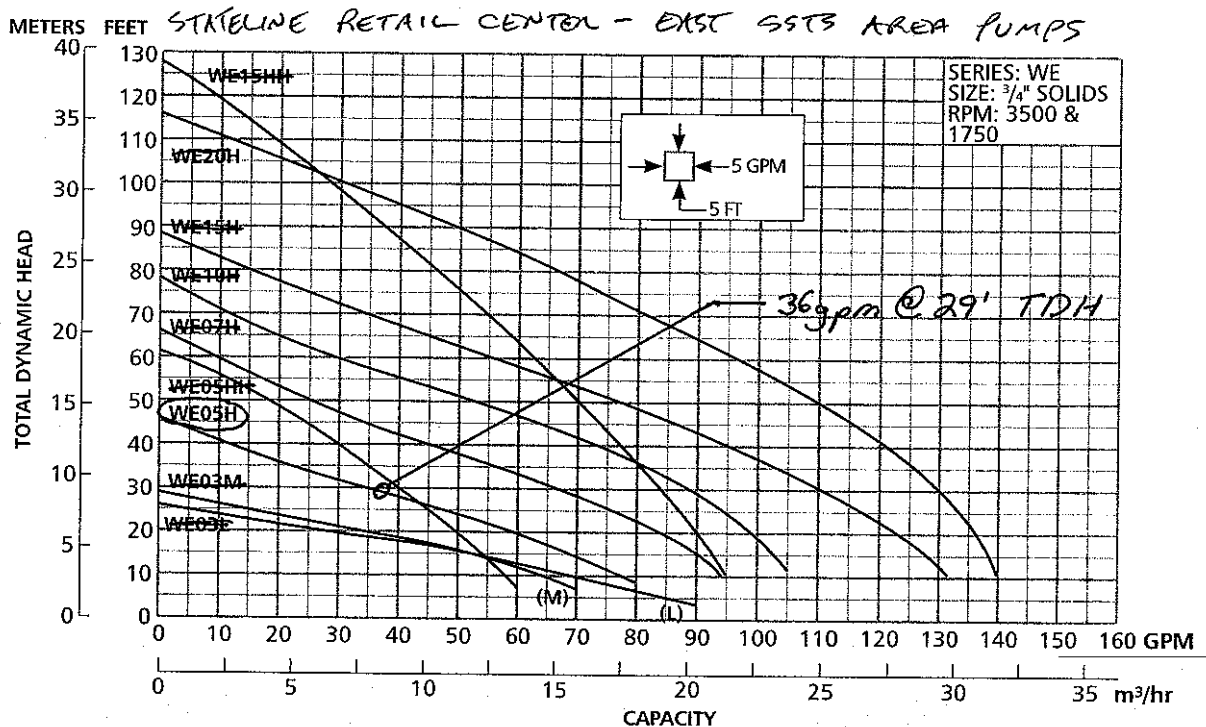
#### Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.
- **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.
- **Bearings:** Upper and lower heavy duty ball bearing construction.
- **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.
- **O-ring:** Assures positive sealing against contaminants and oil leakage.

### AGENCY LISTINGS



Tested to UL 778 and CSA 22.2 108 Standards  
By Canadian Standards Association File #LR38549  
Goulds Pumps is ISO 9001 Registered.



# PUTNAM COUNTY DEPARTMENT OF HEALTH DIVISION OF ENVIRONMENTAL HEALTH SERVICES

## DESIGN DATA SHEET - SUBSURFACE SEWAGE TREATMENT SYSTEM

Applicant: Stateline Retail Center

~~XXXXX~~ c/o P.L.I., LLC

Address 1699 Route 6, Suite 1, Camel, NY 10512

Located at (Street) US Route 6 Tax Map 68 Block 2 Lot 48  
(indicate nearest cross street)

Municipality Southeast Watershed East Branch Reservoir

### SOIL PERCOLATION TEST DATA

Date of Pre-soaking 11-26-07 Date of Percolation Test 11-27-07

Hole No.	Run No.	Time Start - Stop	Elapse Time (Min.)	Depth to Water From Ground Surface (Inches)		Water Level Drop In Inches	Percolation Rate Min/Inch
				Start	Stop		
P1	1	1010-1031	21	26	29	3	7
	2	1032-1056	24	26	29	3	8
	3	1056-1120	24	26	29	3	8
	4						
	5						
P2	1	1042-1112	30	24	27	3	10
	2	1112-1142	30	24	26½	2.5	12
	3	1142-1212	30	24	26½	2.5	12
	4						
	5						
P3	1	1127-1143	16	23	26	3	5.3
	2	1144-1201	17	23	26	3	5.9
	3	1201-1218	17	23	26	3	5.9
	4						
	5						

- NOTES:**
1. Tests to be repeated at same depth until approximately equal percolation rates are obtained at each percolation test hole. (i.e. ≤ 1 min for 1-30 min/inch, ≤ 2 min for 31-60 min/inch). All data to be submitted for review.
  2. Depth measurements to be made from top of hole.

✓

**TEST PIT DATA**  
**DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES**

DEPTH	HOLE NO. <u>D1</u>	HOLE NO. <u>D2</u>	HOLE NO. <u>D3</u>
G.L.			
0.5'	0"-6" TOPSOIL	0"-6" TOPSOIL	0"-6" TOPSOIL
1.0'			
1.5'			
2.0'	6"-84" BROWN	6"-96" BROWN	6"-84" BROWN
2.5'	SLIGHTLY	SLIGHTLY	FINE SAND
3.0'	COMPACTED	COMPACTED	AND SOME
3.5'	FINE SAND	FINE SAND	GRAVEL
4.0'	WITH SILT AND	WITH SILT	
4.5'	GRAVEL	AND GRAVEL	
5.0'			
5.5'			
6.0'			
6.5'			
7.0'	~		~
7.5'			
8.0'		~	
8.5'			
9.0'			
9.5'			
10.0'			

Indicate level at which groundwater is encountered N/A

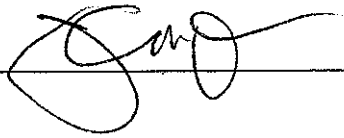
Indicate level at which mottling is observed N/A

Indicate level to which water level rises after being encountered N/A

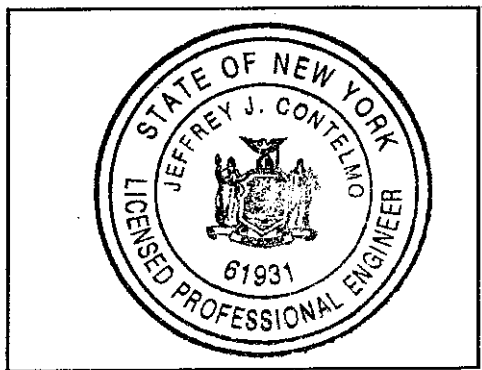
Deep hole observations made by: John M. Watson, P.E. (Insite)  
Joseph Paravati (PCOH)  
David Alderisio (NYCEP) Date 6/19/07

Design Professional Name: Jeffrey J. Contelmo, P.E. Address:

Insite Engineering, Surveying & Landscape Architecture, P.C.  
3 Garrett Place, Carmel, New York 10512

Signature: 

Design Professional Seal



# PUTNAM COUNTY DEPARTMENT OF HEALTH DIVISION OF ENVIRONMENTAL HEALTH SERVICES

## DESIGN DATA SHEET - SUBSURFACE SEWAGE TREATMENT SYSTEM

Applicant: Stateline Retail Center

~~OWNER~~ c/o P.L.I., LLC

Address 1699 Route 6, Suite 1, Camel, NY 10512

Located at (Street) US Route 6 Tax Map 68 Block 2 Lot 48  
(indicate nearest cross street)

Municipality Southeast Watershed East Branch Reservoir

### SOIL PERCOLATION TEST DATA

Date of Pre-soaking 11-26-07 Date of Percolation Test 11-27-07

Hole No.	Run No.	Time Start - Stop	Elapse Time (Min.)	Depth to Water From Ground Surface (Inches)		Water Level Drop In Inches	Percolation Rate Min/Inch
				Start	Stop		
P4	1	1013-1033	20	18	21	3	6.7
	2	1033-1057	24	18	21	3	8
	3	1058-1122	24	18	21	3	8
	4						
	5						
P5	1	1021-1051	30	20	22	2	15
	2	1052-1122	30	20	22	2	15
	3	1123-1153	30	20	22	2	15
	4						
	5						
P6	1	1135-1145	10	24	28	4	2.5
	2	1145-1154	9	24	27	3	3
	3	1154-1203	9	24	27	3	3
	4						
	5						

- NOTES:**
1. Tests to be repeated at same depth until approximately equal percolation rates are obtained at each percolation test hole. (i.e.  $\leq 1$  min for 1-30 min/inch,  $\leq 2$  min for 31-60 min/inch). All data to be submitted for review.
  2. Depth measurements to be made from top of hole.

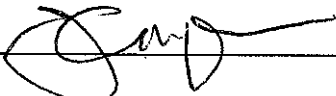
**TEST PIT DATA**  
**DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES**

DEPTH	HOLE NO. <u>D4</u>	HOLE NO. <u>D5</u>	HOLE NO. <u>D6</u>
G.L.			
0.5'	0'-6" TOPSOIL	0'-6" TOPSOIL	0'-6" TOPSOIL
1.0'			
1.5'	6"-92"+ BROWN	6"-84"+ BROWN	6"-84"+ BROWN
2.0'	SLIGHTLY	SLIGHTLY	FINE SAND
2.5'	COMPACTED	COMPACTED	SOME SILT
3.0'	FINE SAND	FINE SAND	AND GRAVEL
3.5'	WITH SILT	WITH SILT	
4.0'	AND GRAVEL	AND GRAVEL	
4.5'			
5.0'			
5.5'			
6.0'	GW		
6.5'	▽ 78"	GW	GW
7.0'	=	▽ 84"	▽ 84"
7.5'	~		
8.0'			
8.5'			
9.0'			
9.5'			
10.0'			

Indicate level at which groundwater is encountered 78" / 84" (D4 / D5 + D6)  
 Indicate level at which mottling is observed N/A  
 Indicate level to which water level rises after being encountered 78" / 84" (D4 / D5 & D6)  
 Deep hole observations made by: John M. Watson, P.E. (Insite) Date 6/19/07  
Joseph Paravati (PCDOH)  
David Alderisio (NYCDEP)

Design Professional Name: Jeffrey J. Contelmo, P.E. Address:

Insite Engineering, Surveying & Landscape Architecture, P.C.  
3 Garrett Place, Carmel, New York 10512

Signature: 

Design Professional's Seal



# PUTNAM COUNTY DEPARTMENT OF HEALTH DIVISION OF ENVIRONMENTAL HEALTH SERVICES

## DESIGN DATA SHEET - SUBSURFACE SEWAGE TREATMENT SYSTEM

Applicant: Stateline Retail Center

~~XXXXX~~ c/o P.L.I., LLC

Address 1699 Route 6, Suite 1, Carmel, NY 10512

Located at (Street) US Route 6

(indicate nearest cross street)

Tax Map 68 Block 2 Lot 48

Municipality Southeast

Watershed East Branch Reservoir

### SOIL PERCOLATION TEST DATA

Date of Pre-soaking 11-26-07

Date of Percolation Test 11-27-07

Hole No.	Run No.	Time Start - Stop	Elapse Time (Min.)	Depth to Water From Ground Surface (Inches)		Water Level Drop In Inches	Percolation Rate Min/Inch
				Start	Stop		
P8	1	1014-1044	30	18	19.5	1.5	20
	2	1046-1116	30	18	19.25	1.25	24
	3	1117-1147	30	18	19.25	1.25	24
	4						
	5						
P9	1	1017-1047	30	24	26	2	15
	2	1049-1119	30	24	26	2	15
	3	1120-1150	30	24	26	2	15
	4						
	5						
P10	1	1127-1157	30	22	24	2	15
	2	1158-1228	30	22	24	2	15
	3	1229-1259	30	22	24	2	15
	4						
	5						

- NOTES:**
1. Tests to be repeated at same depth until approximately equal percolation rates are obtained at each percolation test hole. (i.e.  $\leq 1$  min for 1-30 min/inch,  $\leq 2$  min for 31-60 min/inch). All data to be submitted for review.
  2. Depth measurements to be made from top of hole.



**TEST PIT DATA**  
**DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES**

DEPTH	HOLE NO. <u>D8</u>	HOLE NO. <u>D9</u>	HOLE NO. <u>D10</u>
G.L.			
0.5'	0"-6" TOPSOIL	0"-6" TOPSOIL	0"-6" TOPSOIL
1.0'			
1.5'	6"-90"+ BROWN	6"-84"+ BROWN	6"-90"+ BROWN
2.0'	FINE SAND	VERY FINE	MODERATELY
2.5'	SOME SILT	SAND WITH	COMPACT
3.0'	AND GRAVEL	SOME GRAVEL	FINE SAND
3.5'			WITH SOME
4.0'			SILT, GRAVEL
4.5'			AND ROCK
5.0'			TO 1' Ø
5.5'			
6.0'			
6.5'		GW	
7.0'		84"	
7.5'			
8.0'			
8.5'			
9.0'			
9.5'			
10.0'			

Indicate level at which groundwater is encountered 84" in D9

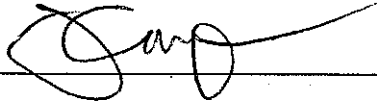
Indicate level at which mottling is observed N/A

Indicate level to which water level rises after being encountered 84" in D9

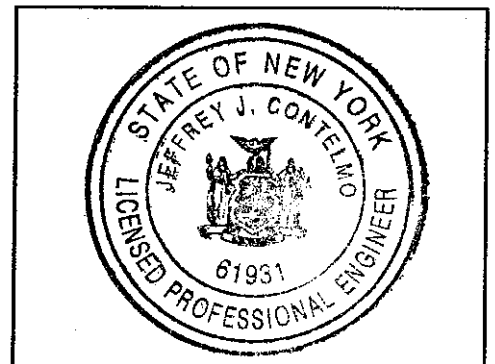
Deep hole observations made by: John M. Watson, P.E. (Insite)  
Joseph Paravati (PCDOH) Date 6/19/07  
David Alderisio (NYCDEP)

Design Professional Name: Jeffrey J. Contelmo, P.E. Address:

Insite Engineering, Surveying & Landscape Architecture, P.C.  
3 Garrett Place, Camel, New York 10512

Signature: 

Design Professional's Seal



# PUTNAM COUNTY DEPARTMENT OF HEALTH DIVISION OF ENVIRONMENTAL HEALTH SERVICES

## DESIGN DATA SHEET - SUBSURFACE SEWAGE TREATMENT SYSTEM

Applicant: Stateline Retail Center

~~XXXXXX~~ c/o P.L.I., LLC

Address 1699 Route 6, Suite 1, Carmel, NY 10512

Located at (Street) US Route 6 Tax Map 68 Block 2 Lot 48  
(indicate nearest cross street)

Municipality Southeast Watershed East Branch Reservoir

### SOIL PERCOLATION TEST DATA

Date of Pre-soaking N/A Date of Percolation Test N/A

Hole No.	Run No.	Time Start - Stop	Elapse Time (Min.)	Depth to Water From Ground Surface (Inches) Start Stop	Water Level Drop In Inches	Percolation Rate Min/Inch
	1					
	2					
	3					
	4					
	5					
	1					
	2					
	3					
	4					
	5					
	1					
	2					
	3					
	4					
	5					

- NOTES:**
1. Tests to be repeated at same depth until approximately equal percolation rates are obtained at each percolation test hole. (i.e.  $\leq 1$  min for 1-30 min/inch,  $\leq 2$  min for 31-60 min/inch). All data to be submitted for review.
  2. Depth measurements to be made from top of hole.



**TEST PIT DATA**  
**DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES**

DEPTH	HOLE NO. <u>D11</u>	HOLE NO. <u>D12</u>	HOLE NO. <u>D13</u>
G.L.			
0.5'	0"-6" TOPSOIL	0"-6" TOPSOIL	0"-6" TOPSOIL
1.0'			
1.5'	6"-60" BROWN	6"-60" BROWN	6"-36" BROWN FINE
2.0'	SLIGHTLY	SLIGHTLY	SAND AND SILT
2.5'	COMPACTED	COMPACTED	
3.0'	FINE SAND	FINE SAND	
3.5'	w/ some	w/ some	
4.0'	SILT & GRAVEL	SILT & GRAVEL	36"-90"+ BROWN
4.5'			FINE SAND
5.0'			
5.5'	60"-84"+ BROWN	60"-84"+ BROWN	
6.0'	SLIGHTLY	SLIGHTLY	
6.5'	COMPACTED	COMPACTED	
7.0'	FINE SILTY	FINE SILTY	GW
7.5'	SAND	SAND	90"
8.0'			
8.5'			
9.0'			
9.5'			
10.0'			

Indicate level at which groundwater is encountered 90" (D13 ONLY)

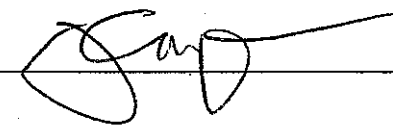
Indicate level at which mottling is observed N/A

Indicate level to which water level rises after being encountered 90" (D13 ONLY)

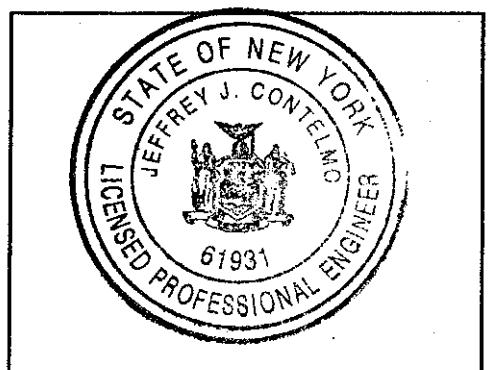
Deep hole observations made by: John M. Watson, P.E. (Insite)  
Joseph Paravati (PDOH)  
David Alderisio (NYCEP) Date 6/19/07

Design Professional Name: Jeffrey J. Contelmo, P.E. Address:

Insite Engineering, Surveying & Landscape Architecture, P.C.  
3 Garrett Place, Carmel, New York 10512

Signature: 

Design Professional's Seal



# PUTNAM COUNTY DEPARTMENT OF HEALTH DIVISION OF ENVIRONMENTAL HEALTH SERVICES

## DESIGN DATA SHEET - SUBSURFACE SEWAGE TREATMENT SYSTEM

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~~OWNER~~ c/o P.L.I., LLC

Address 1699 Route 6, Suite 1, Carmel, NY 10512

Located at (Street) US Route 6 Tax Map 68 Block 2 Lot 48  
(indicate nearest cross street)

Municipality Southeast Watershed East Branch Reservoir

### SOIL PERCOLATION TEST DATA

Date of Pre-soaking N/A Date of Percolation Test N/A

Hole No.	Run No.	Time Start - Stop	Elapse Time (Min.)	Depth to Water From Ground Surface (Inches) Start Stop	Water Level Drop In Inches	Percolation Rate Min/Inch
	1					
	2					
	3					
	4					
	5					
	1					
	2					
	3					
	4					
	5					
	1					
	2					
	3					
	4					
	5					

- NOTES:**
1. Tests to be repeated at same depth until approximately equal percolation rates are obtained at each percolation test hole. (i.e.  $\leq 1$  min for 1-30 min/inch,  $\leq 2$  min for 31-60 min/inch). All data to be submitted for review.
  2. Depth measurements to be made from top of hole.

✓

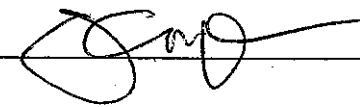
**TEST PIT DATA**  
**DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES**

DEPTH	HOLE NO. <u>D14</u>	HOLE NO. <u>D15</u>	HOLE NO. <u>D16</u>
G.L.			
0.5'	0"-6" TOPSOIL	0"-6" TOPSOIL	0"-8" TOPSOIL
1.0'			
1.5'	6"-60" BROWN	6"-60" BROWN	8"-78" BROWN
2.0'	SLIGHTLY	SLIGHTLY	FINE SILTY
2.5'	COMPACTED	COMPACTED	LOAM
3.0'	FINE SAND	FINE SAND	
3.5'			
4.0'			
4.5'	60"-84"+ BROWN	60"-96"+ BROWN	
5.0'	SLIGHTLY	SLIGHTLY	
5.5'	COMPACTED	COMPACTED	
6.0'	FINE SILTY	FINE SILTY	
6.5'	SAND	SAND	
7.0'			78"-96"+
7.5'		GW 96"	MOTTLED
8.0'		▽ 96"	▽ SILT
8.5'			GW 96"
9.0'		MOTTLED @ 84"	MOTTLED @ 78"
9.5'			
10.0'			

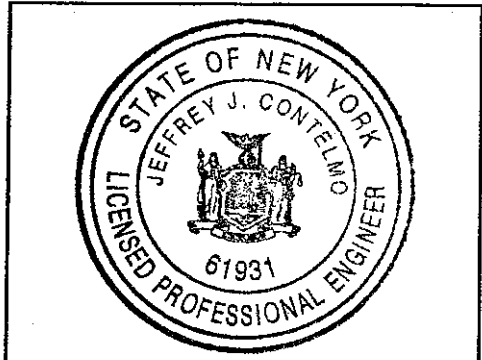
Indicate level at which groundwater is encountered 96" (D15/D16)  
 Indicate level at which mottling is observed 84" / 78" (D15/D16)  
 Indicate level to which water level rises after being encountered 96" (D15/D16)  
 Deep hole observations made by: John M. Watson, P.E. (Insite)  
Joseph Paravati (PCOH) Date 6/19/07  
David Alderisio (NYCDEP)

Design Professional Name: Jeffrey J. Contelmo, P.E. Address:

Insite Engineering, Surveying & Landscape Architecture, P.C.  
3 Garrett Place, Carmel, New York 10512

Signature: 

Design Professional's Seal



# PUTNAM COUNTY DEPARTMENT OF HEALTH DIVISION OF ENVIRONMENTAL HEALTH SERVICES

## DESIGN DATA SHEET - SUBSURFACE SEWAGE TREATMENT SYSTEM

Applicant: Stateline Retail Center

~~XXXXX~~ c/o P.L.L., LLC

Address 1699 Route 6, Suite 1, Carmel, NY 10512

Located at (Street) US Route 6 Tax Map 68 Block 2 Lot 48  
(indicate nearest cross street)

Municipality Southeast Watershed East Branch Reservoir

### SOIL PERCOLATION TEST DATA

Date of Pre-soaking NA Date of Percolation Test NA

Hole No.	Run No.	Time Start - Stop	Elapse Time (Min.)	Depth to Water From Ground Surface (Inches)		Water Level Drop In Inches	Percolation Rate Min/Inch
				Start	Stop		
	1						
	2						
	3						
	4						
	5						
	1						
	2						
	3						
	4						
	5						
	1						
	2						
	3						
	4						
	5						

- NOTES:**
1. Tests to be repeated at same depth until approximately equal percolation rates are obtained at each percolation test hole. (i.e.  $\leq 1$  min for 1-30 min/inch,  $\leq 2$  min for 31-60 min/inch). All data to be submitted for review.
  2. Depth measurements to be made from top of hole.

✓

**TEST PIT DATA**  
**DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES**

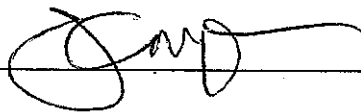
DEPTH	HOLE NO. <u>D17</u>	HOLE NO. <u>D18</u>	HOLE NO. <u>D19</u>
G.L.			
0.5'	0"-6" TOPSOIL	0"-6" TOPSOIL	0"-6" TOPSOIL
1.0'			
1.5'	6"-54" BROWN	6"-60" BROWN	6"-72" BROWN
2.0'	SLIGHTLY	SLIGHTLY	SLIGHTLY
2.5'	COMPACTED	COMPACTED	COMPACTED
3.0'	FINE SAND	FINE SAND	FINE SAND
3.5'	WITH SOME	WITH SOME	WITH SOME
4.0'	SILT AND	SILT AND	SILT AND GRAVEL
4.5'	GRAVEL	GRAVEL	
5.0'			
5.5'	54"-84" BROWN		
6.0'	GW FINE SILTY	60"-96" BROWN	
6.5'	80" LOAM	FINE SILTY	72"-90" BROWN
7.0'		GW LOAM	GW FINE SILTY
7.5'		92"	90" LOAM
8.0'	MOTTLING @ 72"		
8.5'			
9.0'		MOTTLING @ 78"	MOTTLING @ 72"
9.5'			
10.0'			

Indicate level at which groundwater is encountered 80" (D17) 92" (D18) 90" (D19)  
 Indicate level at which mottling is observed 72"/78"/72" (D17/D18/D19)  
 Indicate level to which water level rises after being encountered 80" (D17) 92" (D18) 90" (D19)  
 Deep hole observations made by: John M. Watson, P.E. (Insite) Date 6/19/07  
Joseph Paravati (PCOH)  
David Alderisio (NYCDEP)

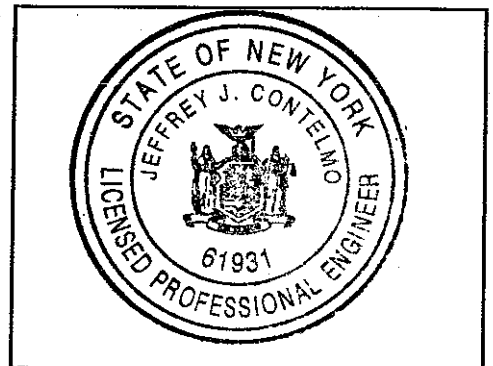
Design Professional Name: Jeffrey J. Contelmo, P.E. Address:

Insite Engineering, Surveying & Landscape Architecture, P.C.  
3 Garrett Place, Carmel, New York 10512

Signature: \_\_\_\_\_



Design Professional's Seal



# PUTNAM COUNTY DEPARTMENT OF HEALTH DIVISION OF ENVIRONMENTAL HEALTH SERVICES

## DESIGN DATA SHEET - SUBSURFACE SEWAGE TREATMENT SYSTEM

Applicant: Stateline Retail Center

~~XXXXX~~ c/o P.L.I., LLC

Address 1699 Route 6, Suite 1, Camel, NY 10512

Located at (Street) US Route 6 Tax Map 68 Block 2 Lot 48  
(indicate nearest cross street)

Municipality Southeast Watershed East Branch Reservoir

### SOIL PERCOLATION TEST DATA

Date of Pre-soaking N/A Date of Percolation Test N/A

Hole No.	Run No.	Time Start - Stop	Elapse Time (Min.)	Depth to Water From Ground Surface (Inches) Start Stop	Water Level Drop In Inches	Percolation Rate Min/Inch
	1					
	2					
	3					
	4					
	5					
	1					
	2					
	3					
	4					
	5					
	1					
	2					
	3					
	4					
	5					

- NOTES:**
1. Tests to be repeated at same depth until approximately equal percolation rates are obtained at each percolation test hole. (i.e.  $\leq 1$  min for 1-30 min/inch,  $\leq 2$  min for 31-60 min/inch). All data to be submitted for review.
  2. Depth measurements to be made from top of hole.

**TEST PIT DATA**  
**DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES**

DEPTH	HOLE NO. <u>D 20</u>	HOLE NO. _____	HOLE NO. _____
G.L.			
0.5'	0"-6" TOPSOIL		
1.0'			
1.5'	6"-78" BROWN		
2.0'	SLIGHTLY		
2.5'	COMPACTED		
3.0'	FINE SAND		
3.5'	WITH SOME		
4.0'	SILT AND		
4.5'	GRAVEL		
5.0'			
5.5'			
6.0'			
6.5'			
7.0'	78"-96" BROWN		
7.5'	FINE SILTY		
8.0'	LOAM		
8.5'			
9.0'			
9.5'	MOTTLING @ 78"		
10.0'			

Indicate level at which groundwater is encountered N/A

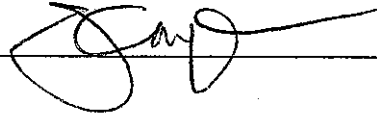
Indicate level at which mottling is observed 78" (D20 ONLY)

Indicate level to which water level rises after being encountered N/A

Deep hole observations made by: John M. Watson, P.E. (Insite)  
Joseph Paravati (PCDH)  
David Alderisio (NYCEP) Date 6/19/07

Design Professional Name: Jeffrey J. Contelmo, P.E. Address: \_\_\_\_\_

Insite Engineering, Surveying & Landscape Architecture, P.C.  
3 Garrett Place, Camel, New York 10512

Signature: 

Design Professional's Seal



# PUTNAM COUNTY DEPARTMENT OF HEALTH DIVISION OF ENVIRONMENTAL HEALTH SERVICES

## DESIGN DATA SHEET - SUBSURFACE SEWAGE TREATMENT SYSTEM

Staseline Retail Center

Owner c/o P.L.I., LLC Address 1699 Route 6, Suite 1, Carmel, NY 10512

Located at (Street) US Route 6 Tax Map 68 Block 2 Lot 48  
(indicate nearest cross street)

Municipality Southeast Watershed East Branch Reservoir

### SOIL PERCOLATION TEST DATA

Date of Pre-soaking 07-09-2008 Date of Percolation Test 07-10-2008

Hole No.	Run No.	Time Start - Stop	Elapse Time (Min.)	Depth to Water From Ground Surface (Inches)		Water Level Drop In Inches	Percolation Rate Min/Inch
				Start	Stop		
11	1	10:01 - 10:31	30	18	19	1	30
	2	10:33 - 11:03	30	18	19	1	30
	3	11:04 - 11:34	30	18	19	1	30
	4						
	5						
12	1	9:59 - 10:29	30	18	20.25	2.25	13.33
	2	10:30 - 11:00	30	18	19.75	1.75	17.14
	3	11:01 - 11:31	30	18	19.75	1.75	17.14
	4						
	5						
13	1	9:56 - 10:26	30	18	19	1	30
	2	10:27 - 10:57	30	17.5	18.5	1	30
	3	10:58 - 11:28	30	18	19	1	30
	4						
	5						

- NOTES:**
1. Tests to be repeated at same depth until approximately equal percolation rates are obtained at each percolation test hole. (i.e.  $\leq 1$  min for 1-30 min/inch,  $\leq 2$  min for 31-60 min/inch). All data to be submitted for review.
  2. Depth measurements to be made from top of hole.

**TEST PIT DATA  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES**

DEPTH	HOLE NO. _____	HOLE NO. _____	HOLE NO. _____
G.L.	_____	_____	_____
0.5'	_____	_____	_____
1.0'	_____	_____	_____
1.5'	_____	_____	_____
2.0'	_____	_____	_____
2.5'	_____	_____	_____
3.0'	_____	_____	_____
3.5'	_____	_____	_____
4.0'	_____	_____	_____
4.5'	_____	_____	_____
5.0'	_____	_____	_____
5.5'	_____	_____	_____
6.0'	_____	_____	_____
6.5'	_____	_____	_____
7.0'	_____	_____	_____
7.5'	_____	_____	_____
8.0'	_____	_____	_____
8.5'	_____	_____	_____
9.0'	_____	_____	_____
9.5'	_____	_____	_____
10.0'	_____	_____	_____
_____	_____	_____	_____

Indicate level at which groundwater is encountered \_\_\_\_\_

Indicate level at which mottling is observed \_\_\_\_\_

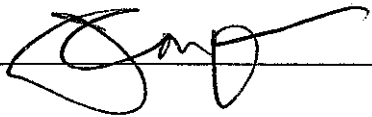
Indicate level to which water level rises after being encountered \_\_\_\_\_

Deep hole observations made by: \_\_\_\_\_ Date \_\_\_\_\_

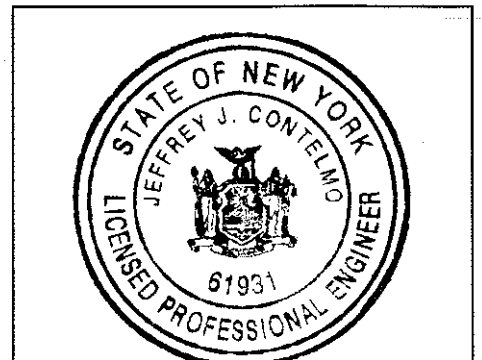
Design Professional Name: Jeffrey J. Contelmo, P.E. Address: \_\_\_\_\_

Insite Engineering, Surveying, & Landscape Architecture, P.C.

3 Garrett Place, Carmel, New York 10512

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### SOIL PERCOLATION TEST DATA

Date of Pre-soaking 07-09-2008 Date of Percolation Test 07-10-2008

Hole No.	Run No.	Time Start - Stop	Elapse Time (Min.)	Depth to Water From Ground Surface (Inches)		Water Level Drop In Inches	Percolation Rate Min/Inch
				Start	Stop		
14	1	9:55 - 10:25	30	18	20.25	2.25	13.33
	2	10:25 - 10:55	30	18	19.75	1.75	17.14
	3	10:56 - 11:26	30	18	19.75	1.75	17.14
	4						
	5						
15	1	9:55 - 10:16	21	18	21	3	7
	2	10:17 - 10:47	30	18	20.5	2.5	12
	3	10:49 - 11:19	30	18	20.5	2.5	12
	4						
	5						
	1						
	2						
	3						
	4						
	5						

- NOTES:**
1. Tests to be repeated at same depth until approximately equal percolation rates are obtained at each percolation test hole. (i.e.  $\leq 1$  min for 1-30 min/inch,  $\leq 2$  min for 31-60 min/inch). All data to be submitted for review.
  2. Depth measurements to be made from top of hole.

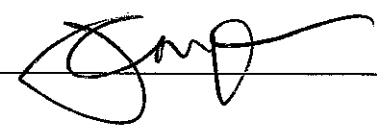
**TEST PIT DATA  
DESCRIPTION OF SOILS ENCOUNTERED IN TEST HOLES**

DEPTH	HOLE NO. _____	HOLE NO. _____	HOLE NO. _____
G.L.	_____	_____	_____
0.5'	_____	_____	_____
1.0'	_____	_____	_____
1.5'	_____	_____	_____
2.0'	_____	_____	_____
2.5'	_____	_____	_____
3.0'	_____	_____	_____
3.5'	_____	_____	_____
4.0'	_____	_____	_____
4.5'	_____	_____	_____
5.0'	_____	_____	_____
5.5'	_____	_____	_____
6.0'	_____	_____	_____
6.5'	_____	_____	_____
7.0'	_____	_____	_____
7.5'	_____	_____	_____
8.0'	_____	_____	_____
8.5'	_____	_____	_____
9.0'	_____	_____	_____
9.5'	_____	_____	_____
10.0'	_____	_____	_____
_____	_____	_____	_____

Indicate level at which groundwater is encountered \_\_\_\_\_  
 Indicate level at which mottling is observed \_\_\_\_\_  
 Indicate level to which water level rises after being encountered \_\_\_\_\_  
 Deep hole observations made by: \_\_\_\_\_ Date \_\_\_\_\_

Design Professional Name: Jeffrey J. Contelmo, P.E. Address: \_\_\_\_\_

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